EXHIBIT B

UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF NEW YORK

IN RE: CAUSTIC SODA ANTITRUST LITIGATION	**Lead Case No.: 1:19-cv-00385-EAW-MJR**
THIS DOCUMENT RELATES TO: **ALL DIRECT PURCHASER ACTIONS**	**HONORABLE ELIZABETH WOLFORD**

DEFENDANTS' POST-EVIDENTIARY HEARING BRIEF IN OPPOSITION TO DIRECT PURCHASER PLAINTIFFS' MOTION FOR CLASS CERTIFICATION

TABLE OF CONTENTS

TABLE OF AUTHORITIES

Cases **Page(s)**

Rules

Other Authorities

INTRODUCTION

This Court held a two-day evidentiary hearing on Plaintiffs' pending motion for class certification. During the hearing, the Court heard testimony from Plaintiffs' expert, Dr. Russell Lamb, and Defendants' expert, Dr. John Johnson. That testimony underscored three basic failures with Dr. Lamb's analyses and confirmed that Plaintiffs' proposed class cannot meet the requirements of Federal Rule of Civil Procedure 23.

First, the caustic soda market is characterized by highly individualized negotiated pricing terms reflected in individual customer contracts, for which Dr. Lamb's analysis failed to adequately account (nor could it do so on a class-wide basis). This presents numerous problems for his analysis and Plaintiffs' ability to demonstrate injury on a *class-wide* basis. As a threshold matter, Plaintiffs' class is defined in relation to specific contract terms, so Dr. Lamb cannot definitively say who is (and who is not) a class member. Because individualized review is needed to determine whether caustic soda transactions were subject to contracts, Dr. Lamb cannot say whether 35% of the transactions he includes in his analysis were actually purchased by class members, and he demonstrably mischaracterized many contract transactions as spot transactions. Further, Dr. Lamb's analysis masks important differences in how individual customers purchase caustic soda, including whether and how the prices they pay react to price increase announcements. This last error is especially egregious given that caustic soda prices are not uniformly tied to a baseline, market price—a fact that becomes clear only if one examines the contracts themselves. In short, because of the complicated contracting landscape unique to the caustic soda industry, proof of antitrust impact for any member of the proposed class requires, at a minimum, accurately identifying whether a customer's transactions are governed by contracts and, if so, how those contracts determine pricing. That analysis cannot be done on a class-wide basis, so Plaintiffs' proposed class does not meet Rule 23(b)(3)'s predominance and superiority requirements.

Second, Dr. Lamb's overcharge regression model does not fit the facts of the caustic soda market. Caustic soda is a globally traded product. This means any reliable model of caustic soda prices in the United States must capture global market factors. Caustic soda is also co-produced with chlorine, which drives caustic soda supply, so any reliable model must also adequately control for chlorine demand. Dr. Lamb's model fails on both counts. It tries to capture global market conditions using a single variable—global alumina production—despite the fact that alumina production accounts for only 17% of global demand for caustic soda, meaning Dr. Lamb's model omits 83% of global demand for caustic soda. When Defendants' expert, Dr. Johnson, tested Dr. Lamb's model for omitted variable bias by adding spot export prices to the model, the overcharge Dr. Lamb found disappeared. Dr. Lamb's model also uses a variable measuring new housing starts in the United States to capture chlorine demand, hypothesizing that because chlorine is used to make PVC, and PVC is used to make houses, housing starts is appropriate. But when Dr. Johnson used PVC prices—a more direct measure of chlorine demand—instead, Dr. Lamb's overcharge disappeared again. Plaintiffs attempt to rely on Dr. Lamb's overcharge regression to show impact on all or nearly all class members using common evidence. But because of these problems with Dr. Lamb's regression, it does not do so, and there is no common evidence of impact.

Third, Dr. Lamb's price increase announcement regression contradicts his overcharge regression, highlighting that the overcharge regression is fundamentally flawed. Dr. Lamb tries to use his price increase announcement regression—a slightly modified version of his overcharge regression—to show that Defendants' price increase announcements caused prices to increase beyond what supply and demand factors alone would predict. Instead, the price increase announcement regression shows that the supply and demand factors Dr. Lamb uses in both

regressions do not accurately capture caustic soda prices in the benchmark period, confirming the modelling issues noted above. Dr. Lamb's price increase announcement regression also shows that, during the alleged class period, there is widespread variation in how customers' prices react to price increases. Across time and across Defendants, prices do not always go up after price increase announcements—sometimes they go up, sometimes they go down, and sometimes they stay the same. Applying a 9.6% average overcharge to every customer's purchases of caustic soda and assuming impact at that level—as Dr. Lamb's overcharge regression does—is wrong. Without Dr. Lamb's overcharge regression, Plaintiffs cannot establish predominance or superiority.

* * *

Class certification is an exception to the basic rule—founded in principles of due process—that a plaintiff must litigate its claims individually. And because it remains an exception, there are unambiguous safeguards in place to ensure that reliable, common evidence can be used to prove that, *inter alia*, the proposed class was injured before allowing Plaintiffs to proceed on a class-wide basis. The evidentiary hearing demonstrated that Dr. Lamb's analysis—on which Plaintiffs rely for certification—cannot satisfy those safeguards. Instead, it masks important differences among the various members of the proposed class relevant to how they purchased caustic soda. The Court should deny Plaintiffs' motion for class certification.

ARGUMENT

I. Plaintiffs Cannot Demonstrate Class Membership, Injury, or Damages Without Individualized Analysis of Class Member Contracts, Which Plaintiffs Have Not Done and Cannot Do by Common Proof.

In the caustic soda industry, significant purchases are made pursuant to individually negotiated contracts with idiosyncratic, customer-specific pricing terms. Notably, this distinguishes the caustic soda industry from many other commodity markets and presents at least two unsurmountable problems for Plaintiffs' class certification bid.

First, determining class membership under Plaintiffs' definition requires identifying and analyzing each contract that governs each purchase transaction, which Plaintiffs and Dr. Lamb admittedly failed to do. *See* Transcript of Evidentiary Hearing on Class Certification ("Tr.") 125:15-131:18; DX-400. Having failed to examine the individual contracts, Dr. Lamb and Plaintiffs cannot reliably identify which purchases are properly included within the class definition. Further, Dr. Lamb's failure to review contracts means he mischaracterized transactions in his regression, rendering his impact and damages results unreliable and due no weight. *See In re Aluminum Warehousing Antitrust Litig.*, 336 F.R.D. 5, 46, 49 (S.D.N.Y. 2020).

Second, because of the wide variation in class members' contract pricing mechanisms, determining whether any proposed class member suffered impact (and the extent of any damages) requires individualized review of those mechanisms, a task that Dr. Lamb's regression cannot accomplish. Individually negotiated, widely varying pricing terms are precisely the reason other courts have found a lack of predominance and denied certification. *See, e.g.*, *In re Lamictal Direct Purchaser Antitrust Litig.*, 957 F.3d 184, 193-94 (3d Cir. 2020); Defendants' Brief in Opposition to Plaintiffs' Motion for Class Certification, Dkt. 486 ("Class Cert. Opp.") 48-50.

A. Dr. Lamb's Failure to Review Individual Contracts Renders His Class Membership, Injury, and Damages Opinions Unreliable and Due No Weight.

Contract terms are inextricable from Plaintiffs' proposed class definition, which excludes three types of caustic soda transactions: (1) purchases under "long-term fixed-price *contracts* that predate October 1, 2015"; (2) purchases under "cost-based *contracts* (such as cost-plus contracts) with no component of price based on a Caustic Soda index"; and (3) purchases under "*contracts* that are priced on an ECU (electrochemical unit) basis with no component of price based on a Caustic Soda index." Plaintiffs' Memorandum of Law in Support of Motion for Class Certification, Dkt. 474-3 at 2 n.4 (emphasis added). Since all of these exclusions depend on

contract terms, assessing class membership necessarily requires a two-part inquiry into each class member's caustic soda transactions:

- *Does a contract exist?* To exclude transactions based on contract terms, Plaintiffs must know whether customers purchased pursuant to a contract.
- *If so, what are the contract terms?* For every contract-based transaction, Plaintiffs must go a step further and review the contract to determine whether the transaction falls under one of Plaintiffs' three exclusions (i.e., if it was under a long-term fixed price contract, a cost-based contract, or an ECU contract).

Plaintiffs rely on Dr. Lamb to satisfy this inquiry, but his analysis fails on both steps. Dr. Lamb did not review individual contracts even though they were produced to Plaintiffs during discovery. *See* Class Cert. Opp. 36 (citing Dr. Lamb's testimony); Tr. 239:10-241:3. The fact that Plaintiffs have no class-wide way to know whether purchases fall within their own class definition without reviewing individual contracts is enough to deny certification. *Calvo v. City of New York*, No. 14-CV-7246 (VEC), 2018 WL 1633565, at *7 (S.D.N.Y. Apr. 2, 2018); *cf. Mazzei v. Money Store*, 829 F.3d 260, 270-272 (2d Cir. 2016).

Despite skipping the critical first step, Plaintiffs and Dr. Lamb forge ahead and group class member purchases into five categories: "Formula," "Negotiated," "Market Basket," "N/A," and "Other." *See* Expert Report of Dr. Russell L. Lamb ("Lamb Rep."), CX-1, ¶ 192 n.554. "N/A" transactions allegedly represent non-contract spot transactions. Expert Reply Report of Dr. Russell L. Lamb ("Lamb Reply"), CX-3, ¶ 75; Tr. 125:15-128:8. "Other" transactions are excluded from the class definition. Lamb Rep., CX-1, ¶ 192 n.554.[1]

[1] "Negotiated" contracts are "negotiated between the parties for a fixed price and a volume target for a period of time (i.e., freely negotiated contracts)," "market basket" contracts are "priced based on the average selling price realized from a negotiated set of contracts," and "other" contracts are long-term fixed price contracts, cost-based contracts, or ECU-based contracts that do not meet the class definition. Lamb Rep., CX-1, ¶ 49 & n.131.

Plaintiffs' inclusion of so-called "N/A" transactions in their proposed class is fundamentally unreliable. Notably, *more than a third* of all caustic soda purchases in Dr. Lamb's regression fall into this category. *Id.* And while Dr. Lamb calls these unassigned purchases "N/A" transactions and assumes they reflect spot sales, *see* Lamb Reply, CX-3, ¶ 75, he did not adequately verify that assumption, Tr. 125:15-131:18. Dr. Lamb does not know whether these transactions correspond to contracts, Tr. 126:9-127:12, so he does not know whether they are governed by one of the three categories of contracts excluded from the class, Tr. 122:12-17; *see also* Tr. 127:13-19 (Dr. Lamb admitting that it "would be more thorough" to review every contract); DX-400 (Dr. Lamb testifying that he did not look at individual contracts). Indeed, Dr. Lamb's original regression mistakenly included at least two sets of transactions governed by contracts that did not satisfy Plaintiffs' own class definition. *See* Expert Report of Dr. John H. Johnson ("Johnson Rep."), CX-2, ¶ 107. Plaintiffs and Dr. Lamb have no reliable means to determine whether his model includes other similar transactions. *See Hunter v. Time Warner Cable Inc.*, No. 15-CV-6445 (JPO), 2019 WL 3812063, at *16-17 (S.D.N.Y. Aug. 14, 2019) (denying class certification because of "the individual inquiries that would be required to determine . . . class membership").

Furthermore, Dr. Lamb's assumption that "N/A" transactions necessarily reflect spot sales is unreliable. Many "N/A" transactions are, in fact, tied to contracts. At the evidentiary hearing, Defense counsel cross-examined Dr. Lamb on 17 examples where he classified OxyChem's transactions with customers as "N/A" even though OxyChem had contracts in place with these customers. Tr. 244:2-248:3; *see* DX-403. Dr. Lamb admitted he would "have to go look at the contract" to determine whether these transactions belong in the class and whether they were improperly classified as "N/A." Tr. 247:19-248:3. These 17 examples are merely illustrative; Dr. Lamb classified nearly 50% of OxyChem's transactions as "N/A." *See* Johnson Rep., CX-2, ¶ 108

& Ex. 24. This issue with Dr. Lamb's analysis is not unique to OxyChem. For example, Dr. Lamb mischaracterized FPC USA's sales to [redacted] as "N/A" even though FPC USA had contracts in place with those customers during the alleged class period. *See* Ex. 1, FPC-USA-DPP-00095563; Ex. 2, FPC-USA-DPP-00095587; Ex. 3, FPC-USA-DPP-00070477.[2] [redacted]. And with Olin's sales to [redacted]. *See* Ex. 6, OLN-001003284 ([redacted]); Ex. 7, OLN-000973111 ([redacted]).[3]

The misclassification errors identified above stem from Dr. Lamb's mistaken reliance on what he calls contract "databases" in lieu of doing an individualized contractual analysis. *See* Lamb Reply, CX-3, ¶ 73; Tr. 330:16-343:8. But there is no record suggesting that the so-called "databases"—which are a seemingly arbitrary collection of Excel worksheets that Dr. Lamb's team pulled from the Defendants' various document productions—in any way reflect a complete accounting of the contracts at issue in this action.[4] [redacted]

[2] Exhibits to this Brief are filed herewith as attachments to the Declaration of David M. Costigan.

[3] [redacted]

[4] Notably, the "databases" were not produced as part of Defendants' rigorously negotiated and collected transaction-level data productions.

[redacted] And these "databases" are just snapshots of the state of Defendants' contracts at a single point in time. They say nothing about how contracts changed over the alleged class period, including whether new contracts were negotiated or whether existing contracts continued under evergreen provisions, were allowed to expire, or were renegotiated.

Tellingly, Defendants identified numerous classification errors caused by Dr. Lamb's reliance on an assortment of spreadsheets rather than a review of the contracts. For example:

- [redacted]: Dr. Lamb relies on an OxyChem contract database for the fact that OxyChem had a contract with [redacted] from January 1, 2013 to December 31, 2015. Ex. 10, OCC_00101390 (row 251). Accordingly, Dr. Lamb labels all OxyChem transactions with [redacted] after December 2015 as "N/A" sales. But review of [redacted] contract with OxyChem shows it "automatically continu[ed] from year to year . . . unless and until canceled." Ex. 11, OCC_00276760. And because the contract database he relied on is frozen in time, Dr. Lamb's analysis also misses the fact that this contract remained active until [redacted] exited it effective December 31, 2017. Ex. 12, OCC_00158389.

- [redacted]: Dr. Lamb relies on the same database for the fact that OxyChem had a contract with [redacted] from April 1, 2012 to March 31, 2014. Ex. 10, OCC_00101390 (row 290). Because the database says the contract expired in March 31, 2014, Dr. Lamb labels every OxyChem/[redacted] transaction as "N/A" after that period, failing to realize that the contract was evergreen and still in effect. Ex. 13, OCC_01136012. And because Dr. Lamb did no further inquiry beyond this database, he did not realize that OxyChem and [redacted] renegotiated and amended their contract effective January 2018. Ex. 14, OCC_00296842.

- [redacted]: Relying on a contract database from 2012, Dr. Lamb assumes that [redacted] had a contract in place with OxyChem from January 1, 2011 to December 31, 2013. Ex. 15, OCC_00137040 (row 329). Because Dr. Lamb relied on this 2012 database, he labelled all OxyChem/[redacted] transactions after December 31, 2013 as "N/A." Again, had he done the necessary individualized inquiry, he would have seen that OxyChem and [redacted] amended their contract several times over the proposed class period and, in fact, had a contract in place during the *entire* period. *See* Ex. 16, OCC_00147259 (first amendment changing pricing mechanism and extending contract to December 2014); Ex. 17, OCC_00147263 (second amendment changing pricing terms and extending contract to December 2017); Ex. 18, OCC_01172808 (third amendment changing pricing terms and extending contract to December 2019).

Dr. Lamb's failure to review contracts does not just undermine his determination of which transactions are included in the proposed class. Indeed, if one were to correctly classify the

contracts Dr. Lamb misclassified as "N/A," all of Dr. Lamb's regression results—including the coefficient used to derive his overcharge estimate—would change. *See* Federal Judicial Center, *Reference Manual on Scientific Evidence* 340 (3d ed. 2011) (hereinafter, "FJC Reference Manual") ("Estimates of the true but unknown parameters of a regression model are numbers that *depend on the particular sample of observations under study*. If a different sample were used, a different estimate would be calculated.") (emphasis added). Reassigning transactions to different contract categories would change Dr. Lamb's data sample, which means his model is unreliable and should be given no weight. *Aluminum Warehousing*, 336 F.R.D. 5, at 46, 49.

B. Determining Whether Any Putative Class Member Suffered Antitrust Injury or Damages Requires an Individualized Review of Contracts.

The prior briefing and hearing testimony demonstrate that the caustic soda industry is characterized by highly individualized contract pricing terms negotiated with many large and sophisticated corporate purchasers, often before the class period started. *See, e.g.*, Tr. 454:2-464:11; Johnson Rep., CX-2, App. E-1 (citing examples of differing contract terms); Class Cert. Opp. 7-9. Accounting for these terms is critical to the Court's predominance inquiry. *See, e.g.*, *In re Lamictal Direct Purchaser Antitrust Litig.*, 957 F.3d at 193-94; Class Cert. Opp. 48-50. The hearing confirmed that Plaintiffs' and Dr. Lamb's reliance on an average overcharge to establish impact and damages fails to adequately and accurately do so, precluding a finding that common issues predominate. *See also* Class Cert. Opp. 36-37, 50-54, 54-57; 57-59.

1. Dr. Lamb's "Formula" Contract Category Masks Differing Pricing Mechanisms Relevant to Whether Customers Suffered Antitrust Injury.

Dr. Lamb's "Formula" contract category masks the differences in pricing mechanisms that affect whether customers' prices went up, down, or remained the same. In preparing data for his overcharge regression, Dr. Lamb connects some transactions to "Formula" contracts, which he says are "formulaically tied to an index." Lamb Rep., CX-1, ¶ 49. Dr. Lamb labels *any* contract

tied in any way to an index as a "Formula" contract, and he treats transactions under all "Formula" contracts identically in his analysis. This creates two distinct problems.

First, his grouping means that his regression includes transactions where antitrust injury is impossible because the transactions were tied to indices that were not allegedly manipulated. As one example, Dr. Lamb's overcharge regression includes transactions under "Formula" contracts where the prices paid were tied solely to *export* prices. Johnson Rep., CX-2, App. E-1 ([redacted]).[5] But as Dr. Lamb acknowledged at the evidentiary hearing, there are no allegations here that Defendants fixed the prices of the caustic soda they exported. Tr. 257:5-9; *see also* Tr. 269:14-270:3; 272:15-17 (no allegations of a conspiracy outside of the U.S). Export prices are determined by global supply and demand factors, not U.S. supply and U.S. demand. Tr. 38:4-11. Because Defendants do not control the global caustic soda market—North America represents only 18% of global caustic soda production—it is implausible that they manipulated export prices. Johnson Rep., CX-2, ¶ 110; Tr. 31:20-32:10; 260:17-25. Customers with pricing tied to export prices (like [redacted]) could not have been injured by Defendants' alleged conduct, but Dr. Lamb included them anyway. The only way to identify other customers whose contracts similarly preclude a finding of antitrust injury would be to go through their contracts, one by one.

Second, his analysis masks enormous variation in the pricing mechanisms in customers' individual contracts. As Dr. Johnson explained at the hearing, treating all contracts that are formulaically tied to an index uniformly (as Dr. Lamb's regression does) does not make sense. Tr. 120:12-122:5. These contracts rely on different indices, start from different base prices, apply

[5] Spot export-dependent contracts are ubiquitous among alumina-producing class members and class members that buy domestic caustic soda for resale abroad. Indeed, Dr. Lamb identifies over a dozen such customers in Appendix C, Exhibit 2 to his Sur-Rebuttal Report.

customer-specific discounts, use regional pricing, implement price caps and floors, blend prices from various indices together, and allow for prices to change at different frequencies. *See* Johnson Rep., CX-2, App. E-1; *see also* Class Cert. Opp. 50-54. Categorizing a contract as a "Formula" contract "means very, very different things" depending on what the contract actually says. Tr. 456:11-23. Determining how a given customer's prices will react to changes in caustic soda market conditions cannot be reduced to *whether* it references a price index because not all formula-based contracts behave similarly. Rather, because of the contract-by-contract variation in pricing mechanisms, one must look at each customer's contracts to determine *how* each complex pricing mechanism will cause that customer's price to vary.

[redacted] *Id.* Compare that pricing mechanism to FPC USA's contract with [redacted], which Dr. Lamb also classified as a "Formula" contract and which Dr. Johnson discussed at the hearing. *See* Tr. 455:22-458:4. Under that contract, the price [redacted] pays in three locations depends on whether two caustic soda indices move in the same or opposite directions, while the price [redacted] pays in a fourth location depends on whether a *different* combination of caustic soda indices move in the same or opposite directions. Johnson Rep., CX-2, App. E-1.

Both of these contracts are very different from [redacted]

[redacted]. *Id.* Dr. Lamb lumps all of these contracts together under the "Formula" contract label, assuming that the prices [redacted] paid for caustic soda respond identically to the supply and demand factors in his overcharge regression. That assumption is contradicted by the terms of these customers' individual contracts, emphasizing the need for an individualized, contract-by-contract review here. *See also* Class Cert. Opp. 50-54.

2. Dr. Johnson's Test of Dr. Lamb's Overcharge Regression Confirms the Need for an Individual, Contract-By-Contract Inquiry.

As Dr. Johnson explained, Dr. Lamb's model says that "every single customer on every purchase for the entirety of the class period would be injured by 9.6%." Tr. 141:25-142:3. This proposition is directly testable. Using a test that Dr. Lamb himself has advocated for in a published paper,[6] Dr. Johnson asked: "is there some way that [the 9.6% average overcharge] is obscuring individual customers who would have avoided the overcharge"? Tr. 142:25-143:3. The test "used the same supply factors, the same demand factors, the same data set that Dr. Lamb used" and "just allowed there to be a different overcharge for each class member." Tr. 145:11-15. Dr. Johnson's test showed that 42% of the proposed class members experienced *no statistically significant positive overcharge*. *See* Johnson Rep., CX-2, Ex. 31. Given the significant differences in customers' contracts for which Dr. Lamb has not controlled, *see supra* § I.B.1, and the fact that the overcharge in Dr. Lamb's model represents "anything that happened in the class period that is

[6] *See* Asher, Arenson & Lamb, *Losing the Forest for the Trees*, 16 VA. L & BUS. REV. 293, 323 (2022) (stating that "plaintiffs and their economists have devised a number of reliable statistical approaches to address the presence of arguably uninjured or differentially injured proposed class members," including "estimat[ing] an overcharge individually for every class member . . . in a common multiple regression, avoiding the problem of slicing and dicing data into unreliably small subsets").

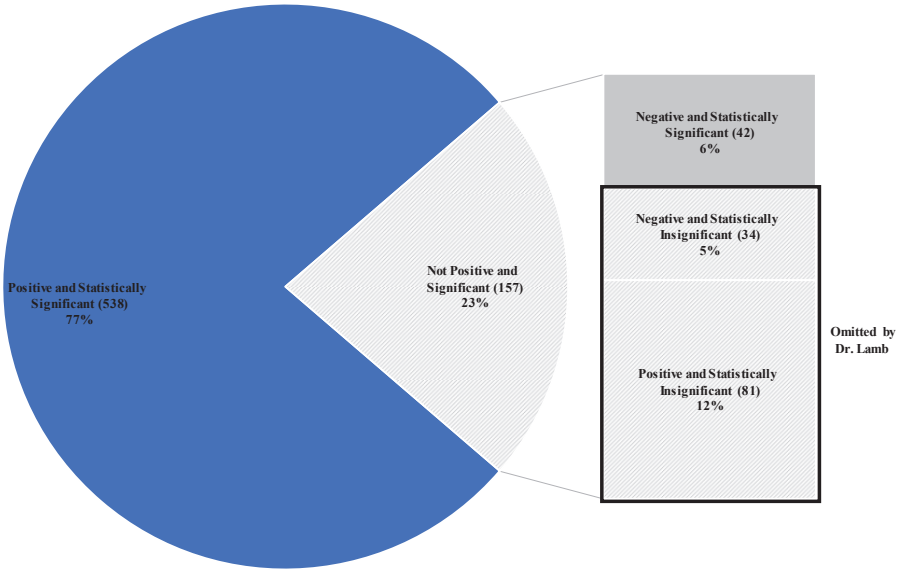
unexplained" by his supply and demand variables, Tr. 29:17-20, this result is not surprising. It demonstrates the masking that Dr. Lamb's regression engages in here.

Dr. Lamb takes issue with Dr. Johnson's 42% number by pointing to the way Dr. Johnson clusters standard errors and calculates statistical significance. Tr. 154:10-22. Dr. Lamb's preferred clustering methodology is incorrect, *see* Johnson Rep., CX-2, ¶ 133 n.322, but even under Dr. Lamb's methodology, almost a quarter of class members experienced no statistically significant overcharge, Lamb Reply, CX-3, ¶ 100; Tr. 151:14-154:3. As the Court recognized at the evidentiary hearing, 23% "is still pretty significant . . . when you're looking at class certification issues" and is not *de minimis*. Tr. 155:12-15.

When pressed by the Court on the importance of so many customers without statistically significant overcharges, Dr. Lamb said that the 23% number "is about calculation of the overcharge to be used for . . . the quantification of damages" and "doesn't tell you anything about injury in fact." 156:5-156:15. That is simply wrong. Dr. Lamb's entire analysis relies on his 9.6% overcharge to establish both antitrust injury *and* damages. Tr. 159:3-161:2. As the Court recognized, "[i]n order for there to be an injury, there has to be an overcharge associated with the alleged illegal conduct." Tr. 162:21-23. Furthermore, Dr. Lamb's own paper contradicts his response. When describing the test Dr. Johnson performed, it says that it "tak[es] advantage of the entire dataset to identify *individual injury and damages*" for each class member. Asher, Arenson & Lamb, *Losing the Forest for the Trees*, 16 VA. L & BUS. REV. 293, 323 (2023) (emphasis added).

The next day,[7] Plaintiffs and Dr. Lamb came back to the Court with a new, previously undisclosed pie chart attempting to adjust the 23% number down to 7%. *See* PX-54. This analysis is intentionally misleading.[8] To go from 23% to 7%, Dr. Lamb pretends that customers with statistically insignificant coefficients do not exist. The chart below shows customers with the four possible types of overcharges: (1) statistically significant and positive; (2) statistically significant and negative; (3) statistically insignificant and positive; (4) statistically insignificant and negative:[9]

CUSTOMER-SPECIFIC OVERCHARGES FROM DR. LAMB'S REPLY REPORT



Notes: Statistical significance is estimated at conventional levels of 5 percent. Standard errors are clustered by combinations of t he supplier, customer, product, the location the caustic soda was shipped from and to, the method of shipment, and the type of contract. Dr. Lamb omits an additional 66 customers from his analysis for whom a coefficient is not able to be estimated.
Source: Lamb Reply Report, Para 100.

To get the 7% number in PX-54, Dr. Lamb takes 42 (i.e., the number of customers with negative and statistically significant coefficients) and divides it by the total number of customers

[7] After lunch on the first day, the Court asked Dr. Lamb if he wanted to clarify any testimony. Dr. Lamb gave a lengthy substantive response but made no mention of the 23% issue or PX-54. *See* Tr. 165:7-168:25.

[8] As Dr. Johnson later pointed out, PX-54 and Dr. Lamb's 7% number are not consistent with Dr. Lamb's prior Reply Report, which says that he found that only 77% of class members had statistically significant overcharges using his clustering methodology. Tr. 453:11-23; Lamb Reply, CX-3, ¶ 100.

[9] This pie chart is a graphical representation of Exhibit 31 of Dr. Johnson's report, except it applies Dr. Lamb's clustering methodology. It is also analogous to PX-54, except it includes the statistically insignificant overcharges Dr. Lamb ignored. *See* Tr. 449:12-450:17 (explaining that PX-54 is a parallel to Dr. Johnson's Exhibit 31).

with statistically significant coefficients (i.e., 42 plus 538). That calculation ignores the 115 customers (34 with negative and statistically insignificant coefficients and 81 with positive and statistically insignificant coefficients) who experienced no overcharge because their overcharges were statistically indistinguishable from zero.

By omitting customers with statistically insignificant overcharges from his analysis, Dr. Lamb intentionally confuses reliability with statistical significance. Here, "statistically insignificant" just means that the estimated overcharges are so close to zero that the statistical test Dr. Johnson performed has no basis to reject the hypothesis that they are, in fact, zero. *See* FJC Reference Manual 253 ("Statistical significance is about the difference between observations and expectations.").[10] In other words, without justification, Dr. Lamb removes customers from his analysis who have an overcharge statistically indistinguishable from zero. Doing so is contrary to other parts of Dr. Lamb's analysis where he recognizes that "statistically insignificant" means "statistically indistinguishable from zero." *See* Lamb Reply, CX-3, tbl.2 n.4 ("If the coefficient estimate . . . was deemed to be not statistically significant in difference from zero at the 5% level, this coefficient was treated as zero.").

3. Plaintiffs' Attempt to Shoehorn the Unique Facts of the Caustic Soda Market and This Case Into Broiler Chickens and Tuna Is Unpersuasive.

The two cases that Plaintiffs raised during the evidentiary hearing are inapposite. The caustic soda market is not at all like the market for broiler chickens, where "focus[ing] on the market price is a reasonable way to demonstrate common impact" despite the existence of contracts because market participants "look to the market price of whole Broilers to determine what the

[10] *See also id.* 251 (explaining that when a result is statistically insignificant, "there is no surprise" and "[t]he sample data are of the type that often would be seen when the null hypothesis is true"). In the test Dr. Johnson performed, the "null hypothesis" is that the overcharges are zero.

price for a specific deal should be." *In re Broiler Chicken Antitrust Litig.* No. 16 C 8637, 2022 WL 1720468, at *14 (N.D. Ill. May 27, 2022). Nor is it like the market for packaged tuna, which is also characterized by pricing mechanisms tied to list prices. *See Olean Wholesale Grocery Coop., Inc. v. Bumble Bee Foods LLC*, 31 F.4th 651, 678 (9th Cir. 2022) (holding that it was plausible that the alleged conspiracy raised the "baseline" price for tuna for all class members). Caustic soda customers' prices are not tied to price lists, and there is no baseline market price. *See* Class Cert. Opp. 48-50. Indeed, Dr. Johnson demonstrated the huge variation in prices purchasers paid in any given month. *See supra* § I.B.1; Johnson Rep., CX-2, Ex. 1. This case is much more like the numerous cases that have found class certification inappropriate where the relevant market is characterized by individualized negotiations. *See, e.g.*, *In re Flash Memory Antitrust Litig.*, No. C 07-0086 SBA, 2010 WL 2332081, at *8 (N.D. Cal. June 9, 2010) ("[A]ntitrust claims predicated on negotiated transactions, as opposed to purchases based on list prices, often entail consideration of individualized proof of impact."); *In re Graphics Processing Units Antitrust Litig.*, 253 F.R.D. 478, 481-82; 490-97 (N.D. Cal. 2008) (denying class certification for wholesale purchasers with individually negotiated sales contracts); *see also* Class Cert. Opp. 48-50, 50-54.

As the Third Circuit explained in *Lamictal*, "whether the market is characterized by individual contract negotiations" was one of the "most important[]" considerations in determining whether it was appropriate for Dr. Lamb (also the expert in that case) to rely on an average overcharge as common evidence for all class members. 957 F.3d at 194. The district court's failure to rigorously analyze whether the market was characterized by individual negotiations was reversible error. *Id.* (reversing class certification); *In re: Lamictal Direct Purchaser Antitrust Litig.*, No. CV 12-995, 2021 WL 2349828, at *21 (D.N.J. June 7, 2021) (denying class certification on remand).

Indeed, the *Broiler Chicken* court distinguished *Lamictal* because the market in *Lamictal* "was characterized by individual sales to direct purchasers, priced through individual negotiations" and because the "transactions for a sophisticated chemical product" in *Lamictal* "b[ore] little resemblance to the daily commodity market for a basic food product like Broilers." 2022 WL 1720468, at *15 n.11. The caustic soda market, as in *Lamictal*, is characterized by "individual sales to direct purchasers, priced through individual negotiations" of contracts (and for those customers with freely negotiated pricing, through further individual negotiations). *Id.* As shown at the hearing, the contracts resulting from these negotiations are not tied to one baseline market price, but instead reflect a wide variety of intricately negotiated pricing mechanisms. Tr. 454:2-462:4. As a result, the averaging assumptions in Dr. Lamb's model are inapposite and cannot be used to demonstrate injury by common proof. *Aluminum Warehousing*, 336 F.R.D. 5, at 46, 49.

II. Dr. Lamb's Overcharge Regression Does Not Adequately Account for Non-Conspiratorial Factors.

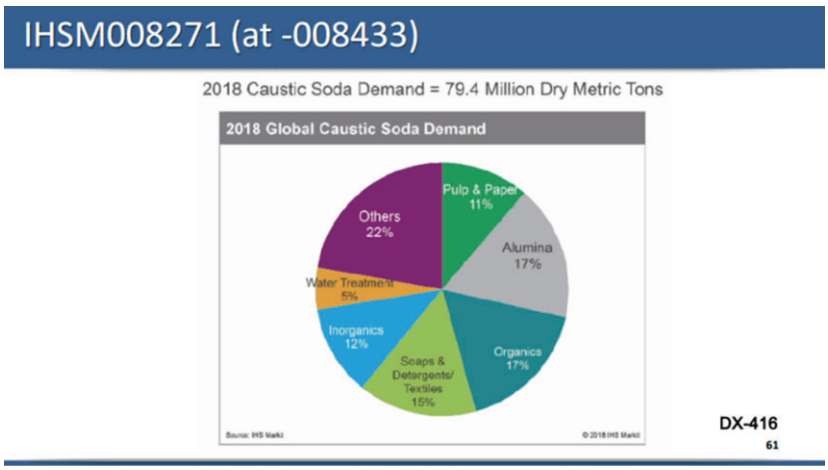
Zooming out from the contract-level pricing mechanisms that determine individual pricing, caustic soda prices in the United States also depend on several macroeconomic factors: demand in the United States, supply in the United States, demand globally, and supply globally. Tr. 30:2-6; CX-6. Dr. Lamb's overcharge regression calls anything not explained by these non-conspiratorial factors an overcharge, so his model must account for them to reliably estimate an overcharge. *See Comcast Corp. v. Behrend*, 569 U.S. 27, 37 (2013) (explaining that a court cannot certify a class if prices are "above what an expert deems 'competitive' . . . [because of] . . . factors unrelated to an accepted theory of antitrust harm"); *Aluminum Warehousing*, 336 F.R.D. at 47 ("[A] plaintiff seeking certification cannot rely on an expert whose 'methodology . . . identifies damages that are not the result of the wrong.'" (quoting *Comcast*, 569 U.S. at 38)); Tr. 30:2-11; CX-6.

Therefore, a court must conduct a "rigorous analysis" into any economic model offered to satisfy Rule 23(b)(3)'s requirements, and if the model omits or mismeasures an important non-conspiratorial factor, then its measure of overcharge is unreliable. *See Comcast*, 569 U.S. at 37; *Aluminum Warehousing*, 336 F.R.D. at 47.[11] Dr. Lamb's model suffers from both problems. First, it suffers from omitted variable bias because it ignores large swaths of global demand for caustic soda. Second, it mismeasures chlorine demand.

A. Dr. Lamb's Overcharge Regression Suffers From Omitted Variable Bias Because It Fails to Fully Account for Global Demand for U.S.-Produced Caustic Soda.

1. Dr. Lamb's Alumina Production Variable Ignores 83% of Global Demand for Caustic Soda.

Dr. Lamb's overcharge regression includes a single control variable—global alumina production excluding North America—to account for global demand for caustic soda. Tr. 272:23-273:10. But globally, caustic soda is used for a wide variety of purposes, not just alumina production. Alumina production accounts for just 17% of global demand for caustic soda. According to an IHS document Dr. Lamb relied on more than 20 times, *see* DX-422, the bulk of global caustic soda demand—that is, the other 83%—is driven by entirely different end uses:



[11] *See also* Defendants' Memorandum of Law in Support of Defendants' Joint Motion to Partially Exclude Opinions and Proposed Testimony of Dr. Russell Lamb, Dkt. 573-2, at 4-11.

The relevant demand for U.S. exports of caustic soda is the agglomeration of *all* of these end-uses for caustic soda globally, not just alumina production. Indeed, at the evidentiary hearing, Dr. Lamb testified that "the way to understand demand for a product is . . . the aggregate demand across all of the uses of that product." Tr. 91:18-21. Or, as Dr. Lamb said later, "[m]arkets work based on the demand for the product across all of the uses." Tr. 105:12-13. That is why his *domestic* demand variable—U.S. industrial production—attempts to account for all of caustic soda's end uses.[12] *See* Lamb Rep., CX-1, ¶ 165. There is no reason his *global* demand variable should be so narrowly focused on alumina production.

Dr. Lamb's justification for only accounting for alumina production in his model is that 74% of Defendants' exports "where the end use could be identified" went to alumina customers. *Id.* ¶ 166. The 74% number—which Dr. Johnson could not replicate, *see* Tr. 446:11-447:2—is misleading and inflated because Dr. Lamb could not identify an end use for more than a third of Defendants' exports. Based on the data in his turnover, only 48.1% of Defendants' exported caustic soda went to alumina production, 34.5% went to unknown end-uses, and 17.3% went to non-alumina customers.[13] Dr. Lamb overstates the importance of alumina by ignoring that up to 51.8% of exports may not have been used for alumina production (and 17.3% were definitely not).

Regardless, just because 48.1% of U.S.-exported caustic soda goes to alumina customers does not mean that Dr. Lamb's model can ignore caustic soda's other major industrial end uses.

[12] As this Court discussed with Dr. Lamb, his use of the U.S. industrial production index to attempt to account for all of caustic soda's end uses is itself flawed as the index includes many industries that do not consume, and thus do not drive demand for, caustic soda. Tr. 99:19-100:22; *see also* 287:23-291:18 (Dr. Lamb acknowledging that he never analyzed which of the twenty-six industries included in the index actually use caustic soda).

[13] To arrive at 74%, Dr. Lamb omitted the 34.5% of sales with unknown end-uses from his calculation and rescaled the percentages to sum to 100%: $\frac{48.1\%}{48.1\% + 17.3\%} \approx 74\%$.

These other markets significantly impact global demand for caustic soda. Indeed, only a fraction of the increased global demand for caustic soda over the proposed class period was driven by increased alumina production. *See* DX-407 (showing that global caustic soda demand increased from ~70 to ~80 million metric tons from 2015 to 2018, but demand attributable to alumina production increased by only ~3 million metric tons over this same period). Accounting for these non-alumina demand increases is particularly important in the caustic soda industry because, as Dr. Lamb readily admits, demand for caustic soda is inelastic, meaning small changes in demand result in large changes in price. *See* Tr. 248:4-249:13; Lamb Rep., CX-1, ¶¶ 79-80

2. U.S. Exports to Europe and Australia Illustrate How Dr. Lamb's Global Alumina Production Variable Fails to Capture Global Export Demand.

Exports of caustic soda from the U.S. to Europe more than doubled (as a percentage of production) during the proposed class period, reducing the amount of caustic soda available for sale in the United States. *See* Lamb Reply, CX-3, fig.3 (showing that the U.S. increased exports to Europe during the class period); DX-411 (same). But Europe is not a major alumina producer, and alumina production makes up only a small portion of caustic soda demand in Europe, so it is improbable that this increase in U.S. exports to Europe was driven by increased alumina production. *See* Tr. 280:20-24; DX-418 (showing that alumina accounts for roughly 7% of European caustic soda demand). Dr. Lamb did no testing to determine if it was. Tr. 279:8-19. Dr. Lamb also conceded that if increased demand in Europe were driven by something other than alumina production, his "alumina production variable wouldn't capture" that effect. Tr. 279:20-280:4; 282:4-7. Furthermore, Dr. Lamb's assertion that changes in U.S. supply caused by increased exports to Europe are *de minimis* and can be ignored, *see* Tr. 69:17-20, is wrong. Even though the U.S.'s increase in exports to Europe was small in magnitude, as discussed earlier, small decreases in caustic soda supply (caused by increased exports to Europe) can lead to large increases

in price because demand for caustic soda is inelastic. *See* Tr. 248:14-249:3; Lamb Rep., CX-1, ¶¶ 79-80. Dr. Lamb cannot just disregard the global effects his model is incapable of explaining.

The story is different in Australia, but the result is the same: global alumina production alone fails to capture the underlying market dynamics. Historically, Australia purchased its caustic soda from China. But during the class period, caustic soda in China became expensive, "which opened opportunities to sell caustic soda from the United States in Australia." Decl. of Dan Green, DX-433, ¶ 15; *see also* Johnson Rep., CX-2, ¶ 35. China's exports of caustic soda (as a percentage of production) decreased during this period, *see* Expert Sur-Rebuttal Report of Dr. Russell L. Lamb ("Lamb Sur-Rebuttal"), CX-5, fig.2, so the U.S. more than doubled its exports to Australia, *see* Johnson Rep., CX-2, App. H; Sur-Reply Expert Report of Dr. John H. Johnson ("Johnson Sur-Reply"), CX-4, Ex. 3. In other words, Australia shifted its caustic soda purchases from China to the U.S., increasing the demand for U.S.-produced caustic soda. Dr. Lamb's alumina production variable cannot account for this shift.[14] As Dr. Johnson explained at the evidentiary hearing, "the reason it can't capture it is because this isn't about the overall change in the amount of caustic soda, this is about the fact there was an export reduction from China to Australia, and the Australian producers had to turn elsewhere, and they turned to the United States." Tr. 64:16-21.

[14] Dr. Lamb offers a flawed, convoluted explanation for how it might. First, he says that if Chinese caustic soda production increased but exports from China decreased, then Chinese domestic demand must have increased. Lamb Sur-Rebuttal, CX-5, ¶ 54. Second, he says that his global alumina production will increase when Chinese domestic demand increases. *Id*; Lamb Reply, CX-3, ¶ 18. Putting these two propositions together, he concludes that global alumina production, through its ability to measure Chinese domestic demand for caustic soda, indirectly captures Australia's shift in demand from Chinese caustic soda to U.S. caustic soda. *See* Lamb Reply, CX-3, ¶ 18. Setting aside other issues with Dr. Lamb's logic, his second proposition is clearly wrong. Alumina production accounts for less than 40% of domestic Chinese caustic soda demand and cannot adequately account for it. *See* Tr. 278:18-279:3. If Chinese domestic demand increased because of anything other than increased alumina production, Dr. Lamb's model would miss this effect. *Id.*; *see also* DX-417.

3. Dr. Johnson Tested Whether Dr. Lamb's Model Omits Major Global Factors, and Dr. Lamb's Model Failed the Test.

Because of the obvious flaws in Dr. Lamb's variable selection, Dr. Johnson tested Dr. Lamb's model for omitted variable bias. The logic of the test is straightforward: If the model properly captures all non-conspiratorial factors, then adding additional explanatory variables will have no effect on the model's overcharge estimate (since whatever new explanatory variable is added will have already been accounted for by the model's original controls). Tr. 30:18-31:3. But if adding an additional explanatory variable *does* change the overcharge estimate, then the model was mistakenly finding that non-conspiratorial factors it omitted were part of the "overcharge." Tr. 31:20-32:3; CX-6. This omitted variable test is well-established. The ABA treatise on antitrust damages[15] explains that "omitted variable bias can be tested by identifying and including in the regression model additional explanatory variables that economic reasoning and other market information suggest are likely to affect the dependent variable." ABA Section of Antitrust Law, *Proving Antitrust Damages: Legal and Economic Issues* § II.6.D.6 (3d ed. 2017) (hereinafter, *Proving Antitrust Damages*); *see also* Tr. 33:6-17; Johnson Rep., CX-2, ¶ 43; *cf. Bickerstaff v. Vassar Coll.*, 196 F.3d 435, 449 (2d Cir. 1999).

Dr. Johnson tested Dr. Lamb's overcharge regression for omitted variable bias by adding several measures of spot export prices to the model. *See* Tr. 32:11-33:17; Johnson Rep., CX-2, ¶¶ 43-45 & Ex. 7. Export prices reflect the prices paid for caustic soda by non-U.S. customers in foreign countries, and they are determined by global supply and demand factors (not U.S. domestic supply and demand). *See* Tr. 38:4-11; Tr. 58:4-7. Therefore, they directly measure global supply and demand and contain the information Dr. Lamb omitted from his regression. *See* Johnson Sur-

[15] Dr. Lamb helped draft this treatise. *See Proving Antitrust Damages*, Preface (thanking Dr. Lamb for "contibut[ing] to the drafting" of the treatise).

Reply, CX-4, ¶ 36. When Dr. Johnson added export prices to Dr. Lamb's model, the coefficients on the variables were almost always statistically significant, the coefficient estimates on Dr. Lamb's explanatory variables changed meaningfully, and Dr. Lamb's overcharge disappeared. *See* Johnson Rep., CX-2, ¶¶ 43-45 & Ex. 7; *compare* Lamb Rep., CX-1, tbl.6 (showing Dr. Lamb's initial regression results) *with* PX-50 (showing how the coefficients Dr. Lamb estimated changed by adding spot export prices). When this happens—that is, when "additional explanatory variables turn out to be statistically significant, and the coefficient estimates on the previously included explanatory variables change substantially when the additional variables are added"—then the original model "likely is misspecified and its results are biased and unreliable." *Proving Antitrust Damages*, § II.6.D.6.[16] In short, Dr. Lamb's model failed the test. *See* Class Cert. Opp. 28-31.

4. Spot Export Prices Do Not Introduce Endogneity Bias.

Dr. Lamb claims that Dr. Johnson's omitted variable test is flawed because adding spot export prices introduces endogeneity bias into Dr. Lamb's overcharge regression. *See* Lamb Reply, CX-3, ¶¶ 24-30. A regression suffers from endogeneity bias if the variable being explained (here, U.S. caustic soda prices) is jointly determined with one of the explanatory variables (here, according to Dr. Lamb, spot export prices). *See id.*; Johnson Sur-Reply, CX-4, App. D-1; Tr. 407:4-8. In other words, Dr. Lamb thinks that there is a simultaneous causal relationship between U.S. domestic prices and spot export prices. *See* Lamb Reply, CX-3, at ¶ 24. Not so.

For there to be a simultaneous causal relationship between U.S. domestic prices and spot export prices, two things must be true: (1) export prices in Europe, Asia, and the Gulf Coast must

[16] Dr. Lamb tries to argue that, because some coefficients in his original model varied significantly (and even changed signs) when export prices were added, Dr. Johnson introduced endogeneity bias into his model. *See* Lamb Reply, CX-3, ¶ 26; Tr. 44:17-49:8. But, as the ABA treatise makes clear, that result is to be expected if Dr. Lamb's model suffers from omitted variable bias. The coefficients change because "there is something about global demand or global supply that Dr. Lamb is missing." Tr. 32:14-33:17.

determine domestic prices in the U.S.; and (2) domestic prices in the U.S. must determine export prices in Europe, Asia, and the Gulf Coast. As Dr. Johnson explained at the hearing, the second causal relationship does not exist here. Tr. 38:4-7. Domestic U.S. prices do not determine spot export prices because export prices are "determined in the foreign market across the world" by the supply and demand factors there, not by supply and demand factors in the United States. Tr. 38:4-7. Indeed, North America accounts for only 18% of worldwide caustic soda production. Johnson Rep., CX-2, ¶ 110. Given the United States's small percentage of worldwide caustic soda production, it is implausible that caustic soda prices in the United States *determine* spot export prices outside of the United States. *See* Tr. 38:4-11.

Examining one of the variables Dr. Johnson added—European spot export prices—helps illustrate the rampant contradictions in Dr. Lamb's and the Plaintiffs' arguments. Dr. Lamb's Reply Report says that Dr. Lamb's overcharge regression accounts for global demand factors because Europe "is not a significant participant in the export market" and has a *de minimis* effect on U.S. domestic caustic soda prices. *See* Lamb Reply, CX-3, ¶¶ 13-15. It cannot be that, on the one hand, European export prices are *jointly determined* with U.S. domestic caustic soda prices (leading to endogeneity) but, on the other hand, the European caustic soda market *has no effect* on U.S. domestic caustic soda prices (absolving Dr. Lamb of the need to capture it). Dr. Lamb cannot have it both ways. If Europe is so isolated from the rest of the world that it has no effect on U.S. or global caustic soda prices—as Dr. Lamb argues in his Reply Report—then including European spot export prices cannot cause endogeneity bias and Dr. Johnson's omitted variable test is indisputably valid. *See* Johnson Sur-Reply, CX-4, ¶ 36 & n.76.

Regardless, even if Dr. Lamb were correct that export prices are simultaneously determined with domestic U.S. caustic soda prices, Dr. Johnson's use of one-month and three-month lags in

his tests breaks whatever simultaneous causal link may exist between export prices and U.S. prices. *See* Tr. 58:16-23; Tr. 34:22-36:12. It would be impossible for one-month or three-month old export prices in Europe or Asia to be simultaneously or jointly determined with *contemporaneous* United States caustic soda prices. *See id.*; Johnson Sur-Reply, CX-4, ¶ 4. The future cannot determine the past; the past has already been determined. Dr. Lamb responds by arguing that the lags Dr. Johnson used are insufficiently long because caustic soda contracts "typically[] carry some form of price protection" and because it might take more than three months for spot export prices to be reflected in contract prices. Tr. 51:24-53:14; *see also* Lamb Sur-Rebuttal, CX-5, ¶ 58. This criticism is pure speculation—especially given that Dr. Lamb did not examine individual contracts, *see* Tr. 240:10-241:3—and Dr. Lamb has offered no empirical analysis whatsoever to back up his claims. Unlike Dr. Lamb, Dr. Johnson actually reviewed caustic soda contracts and concluded that a three-month lag is sufficient. *See* Tr. 58:16-23.

B. Dr. Lamb's Overcharge Model Is Highly Sensitive to His Chlorine Control Variable, Further Undercutting Its Reliability.

Dr. Lamb's overcharge regression is also unreliable because it mismeasures chlorine demand. Chlorine and caustic soda are produced together, and Dr. Lamb and Dr. Johnson agree that chlorine demand is one of the key drivers of caustic soda prices because chlorine demand affects the supply of caustic soda. *See* Johnson Rep., CX-2, ¶ 80; Lamb Rep., CX-1, ¶ 33; *see also* Tr. 73:4-11. To control for chlorine demand, Dr. Lamb used an explanatory variable measuring new privately-owned housing units started in the United States. Lamb Rep., CX-1, ¶ 186. He claims that housing starts is appropriate because "chlorine is used to make derivatives EDC and VCM which in turn make PVC, and PVC demand is largely driven by home construction." *Id.*

Dr. Lamb is incorrect. For example, chlorine demand was flat or decreasing between 2017 and 2019, but housing starts trended upward for most of that period. *Compare* Johnson Rep.,

CX-2, Ex. 20 *with* Lamb Reply, CX-3, fig.5; *see* Tr. 75:4-17 (Dr. Johnson explaining that housing starts follows "a trend that goes straight up," which is inconsistent with how "demand of chlorine drops off" in 2018 and 2019). Dr. Lamb also did no analysis to determine how much PVC is used in new construction as opposed to other areas, so he has no basis to conclude that housing starts adequately captures PVC demand, let alone chlorine demand. Tr. 82:11-20. Therefore, his overcharge regression does not adequately capture changes in chlorine demand that impacted caustic soda prices during the proposed class period.

A much more direct measure of chlorine demand is PVC prices, since PVC is the primary use for chlorine. *See* Johnson Rep., CX-2, ¶¶ 132-134; Tr. 73:12-25. Because Dr. Johnson claims that Dr. Lamb mismeasured chlorine demand, he replaces Dr. Lamb's housing starts with PVC prices. *Id.* When he does so, Dr. Lamb's overcharge disappears, again showing the unreliability of Dr. Lamb's analysis. *See* Johnson Rep., CX-2, Ex. 30. Dr. Johnson's test is fully consistent with the ABA treatise on antitrust damages: Regression "results should be tested to make sure they are robust to reasonable changes in the set of control variables—including reasonable alternative variables used to capture similar economic concepts, such as alternative cost or demand controls." *Proving Antitrust Damages*, § II.6.D.6. If, like Dr. Lamb's model, the regression results are *not* robust and are "highly sensitive to particular choices of explanatory variables"—here, Dr. Lamb's choice of housing starts instead of PVC prices—then the model has "a high likelihood of being affected by specification error and thus should generally not be relied upon." *Id.*

Dr. Lamb lobs two criticisms at Dr. Johnson's test: (1) he says that Dr. Johnson should have added PVC prices, not substituted them for housing starts, *see* Tr. 78:7-24; and (2) he says that PVC prices are endogenous, *see* Lamb Reply, CX-3, ¶ 34. Dr. Lamb's first criticism misunderstands the purpose of Dr. Johnson's test. Adding PVC prices would have been

appropriate if Dr. Johnson were testing Dr. Lamb's model for omitted variable bias. But Dr. Johnson claimed that Dr. Lamb's model mismeasured chlorine demand, not that it omitted it, so he was testing an alternative measure to assess the robustness of Dr. Lamb's model to a reasonable change in his chlorine demand variable. Tr. 76:8-24; Tr. 83:6-15; *see also* Johnson Rep., CX-2, ¶¶ 132-134. Dr. Lamb's second criticism—not raised at the evidentiary hearing—also has no merit. The record is clear that chlorine demand drives caustic soda supply, not the other way around. *See* Tr. 75:18-23; *see also* PX-57 ("Therefore, the supply of caustic soda is determined by the demand of chlorine and chlorine derivatives"). There is no simultaneous causal relationship between PVC prices and caustic soda. And even if there were a valid endogeneity concern—which there is not—Dr. Johnson's use of lagged PVC prices solves it. *See* Tr. 75:18-25. It does not make sense that domestic U.S. caustic soda prices *today* could be jointly determined with PVC prices *one month ago*. As with spot export prices, lagging breaks any possible joint determination. The sensitivity of Dr. Lamb's regression results to changes in control variables underscores his model's unreliability. *See Proving Antitrust Damages*, § II.6.D.6.

III. Dr. Lamb's Price Increase Announcement Regression Contradicts His Overcharge Regression, Highlighting Both Models' Unreliability.

In his Reply Report, Dr. Lamb introduced a new analysis—his price increase announcement regression—responding to Dr. Johnson's analysis showing that customers' prices did not react uniformly to price increase announcements. *See* Lamb Reply, CX-3, ¶ 124 & tbl.2; *see also* Johnson Rep., CX-2, ¶¶ 46-55 & Exs. 8-13. The goal of Dr. Lamb's new regression was to "look at how transaction level prices changed following each price increase announcement after controlling for supply and demand factors, as well as customer, Defendant, product, contract type, shipping mode, and shipping origin and destination." Lamb Reply, CX-3, ¶ 124.

But the results from Dr. Lamb's price increase announcement regression contradict the results from his overcharge regression in numerous ways, undercutting the reliability of both models. On the one hand, according to Dr. Lamb's original overcharge regression, caustic soda prices can be fully explained by Dr. Lamb's supply and demand factors in the benchmark period, and all customers experienced an average overcharge of 9.6% during the alleged class period. *See* Lamb Rep., CX-1, ¶ 171. On the other hand, according to his price increase announcement regression, caustic soda prices were, on average, 1.7% below what Dr. Lamb's supply and demand factors predicted after price increase announcements during the benchmark period and, on average, 2.6% above what Dr. Lamb's supply and demand factors predicted after price increase announcements in the alleged class period. Lamb Reply, CX-3, ¶ 124. These very different conclusions cannot be reconciled. In particular, the price increase announcement regression's finding that prices should have been 1.7% lower in the benchmark period does not make sense. There was no alleged anticompetitive conduct in the benchmark period, so, as Dr. Johnson explained, Dr. Lamb's price increase announcement model should have predicted that price increase announcements had no effect on prices. Tr. 178:2-179:5. The fact that it does not means there is something wrong with the supply and demand factors Dr. Lamb uses in both models; they do not fully explain caustic soda prices in the benchmark period.

The price increase announcement regression also undermines Dr. Lamb's opinion—based on his overcharge regression—that applying a single 9.6% average overcharge to every customer is appropriate. The results from Dr. Lamb's price increase announcement regression show considerable variation in the effect of price increase announcements across time and across Defendants. *See* Johnson Sur-Reply, CX-4, Ex. 1. As Dr. Johnson explained, "this means that there are periods of time and sets of class members who purchased in these windows" where the

prices they paid "were not above [Dr. Lamb's] but for price," which "directly contradicts the predicate that customers all experience price increase announcements." Tr. 177:4-177:11. Sometimes customers' prices decreased after price increase announcements below what would be expected given the supply and demand conditions Dr. Lamb controlled for, sometimes they were higher, and sometimes price increase announcements had no effect at all. *See* Johnson Sur-Reply, CX-4, ¶ 16 & Ex. 1. These results are inconsistent with Dr. Lamb's conclusion that it is appropriate to apply a common overcharge to all customers, *see* Tr. 177:4-178:13; Johnson Sur-Reply, CX-4, ¶ 13. However, they are fully consistent with the analysis presented in Dr. Johnson's initial report showing that customers' prices did not react uniformly to price increase announcements. *See* Tr. 177:11-13; *see also* Johnson Rep., CX-2, Exs. 8-13.

Faced with these inconsistencies between his own two models, Dr. Lamb's response is that he used the regressions for different purposes and the coefficients in his price increase announcement regression cannot be interpreted as overcharges. *See* Tr. 183:19-184:23; Tr. 210:4-211:2; *see also* Lamb Sur-Rebuttal, CX-5, ¶ 19. Notably, this diverges with Plaintiffs' own position; in their Reply in support of class certification they argue that Dr. Lamb's "overcharge of 9.6% over the whole Class Period can be thought of as the result after compounding the effects of the 2.6% increase after each price increase announcement" from Dr. Lamb's price increase announcement regression. *See* Plaintiffs' Reply Memorandum of Law in Support of Motion for Class Certification, Dkt. 499 at 19 n.56. Comparing the results from the two regressions is natural. For starters, Dr. Lamb confirmed at his first deposition that his overcharge regression captures the effect of price increase announcements. Ex. 19, Lamb Deposition Tr. 114:24-115:8. The two models are also very similar: when designing his price increase announcement regression, Dr. Lamb's only change was replacing the single overcharge indicator variable in his overcharge

regression with different indicator variables for each of Defendants' price increase announcements. *See* Johnson Sur-Reply, CX-4, ¶ 10. He left everything else unchanged, including the supply and demand control variables. *Id.* ¶ 8.

Dr. Lamb also used *both* regressions to measure what caustic soda prices would have been but-for the alleged conspiracy because of price increase announcements. When summarizing his overcharge regression in his Reply Report, he wrote that it "demonstrated that Class members' prices during the Class Period were elevated above levels that would be explained by supply and demand factors alone." Lamb Reply, CX-3, ¶ 123. In the very next paragraph, when describing his price increase announcement regression, he wrote that his "analysis found that announced price increases effective during the Class Period raised prices on average by 2.6% above what would be expected based on supply and demand factors alone." Lamb Reply, CX-3, ¶ 124; *see also* Tr. 174:15-175:4; Tr. 211:7-214:25. Both models are trying to determine whether caustic soda customers paid higher prices than they should have by comparing their prices to what would be expected based on supply and demand factors alone. The overcharge regression does so by looking at the whole class period at once, while the price increase announcement regression does so by looking at each price increase announcement individually. Dr. Lamb cannot waive away the results of his price increase announcement regression in the face of inconvenient implications. They contradict and undermine his original overcharge regression and confirm that both regressions are unreliable.

CONCLUSION

For the foregoing reasons, and for the reasons in the Defendants' Brief in Opposition to DPPs' Motion for Class Certification, the Court should deny Plaintiff's Motion for Class Certification.

Dated: July 17, 2023

Respectfully submitted,

/s/ William R.H. Merrill
William R.H. Merrill *(pro hac vice)*
James T. Southwick *(pro hac vice)*
Elizabeth B. Hadaway *(pro hac vice)*
SUSMAN GODFREY L.L.P.
1000 Louisiana Street, Suite 5100
Houston, Texas 77002-5096
Tel: (713) 651-9366
bmerrill@susmangodfrey.com
jsouthwick@susmangodfrey.com
ehadaway@susmangodfrey.com

/s/ *Terrance P. Flynn*
Terrance P. Flynn
HARRIS BEACH PLLC
Larkin at Exchange
726 Exchange Street, Suite 1000
Buffalo, New York 14210
Tel: (716) 200-5050
tflynn@harrisbeach.com

Counsel for Defendant Westlake Chemical Corp.

/s/ Steven E. Bizar
Steven E. Bizar
George G. Gordon *(pro hac vice)*
Julia Chapman *(pro hac vice)*
John McClam *(pro hac vice)*
David Costigan *(pro hac vice)*
Agnese Nadalini *(pro hac vice)*
DECHERT LLP
2929 Arch Street
Philadelphia, PA 19104
Tel: (215) 994-4000
steven.bizar@dechert.com
george.gordon@dechert.com
julia.chapman@dechert.com
john.mcclam@dechert.com
david.costigan@dechert.com
agnese.nadalini@dechert.com

Timothy J. Graber
Brian P. Crosby
Melissa M. Morton
GIBSON, MCASKILL & CROSBY, LLP
69 Delaware Avenue, Suite 900
Buffalo, NY 14202
Tel: (716) 856-4200
tgraber@gmclaw.com
bcrosby@gmclaw.com
mmorton@gmclaw.com

Counsel for Defendant Occidental Chemical Corp.

/s/ Alan M. Unger
Alan M. Unger
Tom A. Paskowitz
Peter J. Mardian
SIDLEY AUSTIN LLP
787 Seventh Ave.
New York, NY 10019
Tel: (212) 839-5300
aunger@sidley.com
tpaskowitz@sidley.com
pmardian@sidley.com
Counsel for Defendant Formosa Plastics Corp., USA

/s/ John DeQ. Briggs
John DeQ. Briggs
Richard B. Dagen
AXINN, VELTROP & HARKRIDER LLP
1901 L Street NW
Washington, DC 20036
Tel: (202) 912-4700
jbriggs@axinn.com
rdagen@axinn.com

Angela M. Farren
AXINN, VELTROP & HARKRIDER LLP
114 West 47th Street

New York, New York 10036
Tel: (212) 728-2204
afarren@axinn.com

Randall D. White
CONNORS LLP
1000 Liberty Building
424 Main Street
Buffalo, NY 14202
Tel: (716) 852-5533
rdw@connorsllp.com

Counsel for Defendant Shintech Incorporated

/s/ Corey Roush
Corey Roush
J. Matthew Schmitten
AKIN GUMP STRAUSS HAUER & FELD LLP
2001 K Street, N.W.
Washington, DC 20006
Tel: (202) 887-4115
croush@akingump.com
mschmitten@akingump.com

Stephen A. Sharkey
BOND, SCHOENECK & KING PLLC
200 Delaware Ave., Suite 900
Buffalo, NY 14202-2107
Tel: (716) 416-7051
ssharkey@bsk.com

Counsel for Defendants K.A. Steel Chemicals, Inc. and Olin Corp.